

**Amendments to the Drawings:**

The attached sheet of drawings includes newly added Fig. 4.

Attachment: Replacement Sheet

**REMARKS**

Claims 1 and 4 are pending.

Claim 1 has been amended to include the limitations of former Claim 8.

Claims 2, 3 and 5-9 have been canceled, without prejudice.

Figure 4 has been added. See Figure 3; and page 2, lines 20-25, and page 4, line 28 through page 5, line 1 of the specification. It is submitted that this amendment introduces no new matter.

The specification at page 3, line 15 has been amended to include the description of newly added Figure 4. See Figure 3; and page 2, lines 20-25, and page 4, line 28 through page 5, line 1 of the specification. It is submitted that this amendment introduces no new matter.

The specification at page 5, line 1 has been amended to recite that Fig. 4 shows a ceramic tube 3' in which the cylindrical end face 11' of the ceramic tube 3' extends still further inwards (with respect to the ceramic tube 3 of Fig. 3); that the cylindrical end face 11' then forms an angle of less than ninety degrees with the bevel 12' of the inner surface 13' of the ceramic tube 3'; and that the triple junction 9' is where the three materials (vacuum, metal and ceramic) meet. See Figure 3; and page 2, lines 20-25, and page 4, line 28 through page 5, line 1 of the specification. It is submitted that this amendment introduces no new matter.

A Petition for a three-month Extension of Time, and a precautionary Notice of Appeal accompany this Amendment.

**REJECTIONS UNDER 35 U.S.C. § 112, ¶1**

The Examiner rejects Claims 8 and 9 on the ground of failing to comply with the written description requirement. The Examiner takes the position that the specification, at page 4, lines 28-30 (**Examiner's emphasis**) "only discusses a **theoretical possibility** of the invention and not an actual part of the invention."

This rejection is respectfully traversed as applied to Claim 1, as amended, and Claim 4.

First, the specification does not recite "theoretical possibility" or the word "possibility" as was stated by the Examiner.

Second, in the specification, the word "theory" is used in association with the terms "field strength" or "electric field distribution". Thus, the embodiment of former Claim 8 is not a theoretical thought. Only the prediction of the field strength or electric field

distribution is labelled as being better “in theory”. For example, this field was calculated using a model since actual measurement is believed to be at least very difficult.

Third, the specification expressly discloses the structure being claimed. For example, the specification at page 2, lines 20-25 states (*emphasis added*) that:

With an angle of less than ninety degrees (so that the cylindrical end face of the ceramic tube continues further towards the inner side of the vacuum circuit breaker along the metal of the end cap), the field strength is in theory reduced still further. However, the *production* of a tube of this type is less easy and therefore more expensive, making an embodiment of this type less economically attractive.

The fact that the production of such a ceramic tube might be less easy and more expensive does not mean that such a ceramic tube is a “theoretical possibility” as was stated by the Examiner. Also, the specification at page 4, line 28 through page 5, line 1 (*emphasis added*) states that:

The electric field distribution could in theory be even better if the cylindrical end face 11 of the ceramic tube 3 *extends still further inwards*: the cylindrical end face 11 *then forms an angle of less than ninety degrees* with the bevel 12 (indicated by a dashed line) of the inner surface 13 of the ceramic tube. However, a tube 3 of this shape is even more difficult to *produce and process in the manufacture* of vacuum circuit breakers 10, and is therefore more expensive. For economic reasons, a tube of this type is not attractive.

Again, the fact that a ceramic tube is relatively more difficult to produce and process, is relatively more expensive, and for economic reasons is not attractive, does not mean that such a ceramic tube is a “theoretical possibility” as was stated by the Examiner.

Fourth, Figure 3 shows the claimed structure, albeit in dotted line form.<sup>1</sup>

An applicant shows possession of the claimed invention by describing the claimed invention with all of its limitations using such descriptive means as *words, structures, figures, [and] diagrams*, ... that fully set forth the claimed invention. Lockwood v. American Airlines, Inc., 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997). Possession may be shown in a variety of ways including ... by showing that the invention was “ready for patenting” such as by the disclosure of *drawings* ... that show that the invention was complete, or *by describing distinguishing identifying characteristics* sufficient to show that the applicant was in possession of the claimed invention. See, e.g.,

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<sup>1</sup> Newly added Figure 4 shows the claimed structure in solid line form.

Pfaff v. Wells Elecs., Inc., 525 U.S. 55, 68, 119 S.Ct. 304, 312, 48 USPQ2d 1641, 1647 (1998); Eli Lilly, 119 F.3d at 1568, 43 USPQ2d at 1406; Amgen, Inc. v. Chugai Pharmaceutical, 927 F.2d 1200, 1206, 18 USPQ2d 1016, 1021 (Fed. Cir. 1991) .... “Compliance with the written description requirement is essentially a fact-based inquiry that will ‘necessarily vary depending on the nature of the invention claimed.’” Enzo Biochem, \*\*>323 F.3d at 963<, 63 USPQ2d at 1613.

MPEP § 2163 (2100-172, 2100-173) (*emphasis added*).

Applicants have clearly shown possession of the claimed invention by describing the claimed invention with all of its limitations using such descriptive means as words and diagrams that fully set forth the claimed invention. The claimed invention was “ready for patenting” such as by the disclosure of the drawings that show that the invention was complete, and by the description of distinguishing identifying characteristics. Thus, the application, as filed, clearly shows that Applicants had possession of Claim 1, as amended. Therefore, it is submitted that Claim 1 complies with the written description requirement and, thus, passes muster under Section 112, first paragraph.

It is submitted that the Examiner has presented no citation of fact or law for the present rejection under Section 112, first paragraph on the basis of “theoretical possibility of ... invention”. At best, the Examiner’s discussion of the dotted line 12 and the triple junction 9 of Figure 3 deals with Figure 3 not illustrating the claimed invention in solid line drawing. To the extent that this discussion might present a possible objection to the drawings, Figure 4 has been added to show the solid line 12' and the triple junction 9'. See Figure 3; and page 2, lines 20-25, and page 4, line 28 through page 5, line 1 of the specification. It is submitted that this amendment introduces no new matter. Also, to the extent that this discussion might present a possible objection to the specification, the specification has been similarly amended in order to discuss newly added Figure 4. Again, it is submitted that this amendment introduces no new matter.

Claim 4 depends from Claim 1. Claim 4 complies with the written description requirement and, thus, passes muster under Section 112, first paragraph, for the same reasons that were discussed above in connection with Claim 1.

#### **REJECTIONS UNDER 35 U.S.C. § 102(b)**

The Examiner rejects Claims 1-9 on the ground of being anticipated by U.S. Patent No. 4,962,289 (Stegmüller), or U.S. Patent No. 4,445,016 (Sinnecker), or DE 9205493U (Siemens AG).

Stegmüller discloses a switch chamber for a vacuum switch including a housing composed of a cylindrical ceramic insulating tube. A relatively stiff cover 4 (Figure 2) results in high mechanical stress peaks at individual locations within cylindrical ceramic tube 5 and at the solder connection between cover 4 and cylindrical ceramic tube 5. A cover 14a (Figure 3) forms the connection between cylindrical ceramic tube 5 and contact pin 3 by way of an inner portion in the form of a bellows-type cylinder 21. An elastic disc 28 (Figure 5) may be provided in a supporting member 9 to absorb mechanical shocks caused by the housing when it springs back.

Sinnecker discloses (Figures 1 and 2) a vacuum switching tube 10 in the vicinity of its upper end which is connected to a head piece 7. A metal cap 26 is soldered to the upper annular end of a hollow cylindrical ceramic insulator 25 at the upper end of the vacuum switching tube 10.

Siemens AG (Figure 1) shows a beveled cylindrical tubular structure 2 abutting an L-shaped structure 3 in which the cylindrical tubular structure 2 has a bevel on an outer side thereof.

Claim 1, as amended, recites a ceramic tube for use in a vacuum circuit breaker, the ceramic tube being cylindrical in shape with a set length and a set internal diameter, with a cylindrical end face at each end of the cylinder shape, each cylindrical end face being structured to be secured in a vacuum-tight manner to a metal end cap to form a vacuum chamber, characterized in that the cylindrical end face is shaped in such a manner that, in the assembled state, it makes contact with the metal end cap at least as far as the internal diameter of the ceramic tube in order to prevent, in operation of the vacuum circuit breaker, a concentration of electrical field at the triple junction of metal end cap, ceramic tube and vacuum chamber, wherein the cylindrical end face on an inner side of the ceramic tube forms an angle of substantially 90°, but less than 90°, with an inner surface of the ceramic tube.

The Examiner states (Office Acton, page 4, ¶1) that Stegmüller discloses a ceramic tube 5 "in which the cylindrical end face on an inner side of the ceramic tube forms an angle of substantially 90°, but not greater than 90° with an inner surface of the ceramic tube." The Examiner states (Office Acton, page 5, ¶1) that Sinnecker discloses a ceramic tube 25 "in which the cylindrical end face on an inner side of the ceramic tube forms an angle of substantially 90°, but not greater than 90° with an inner surface of the ceramic tube." The Examiner states (Office Acton, page 6, ¶1) as apparently applied to Siemens AG, that this

reference discloses a ceramic tube 2 "in which the cylindrical end face on an inner side of the ceramic tube forms an angle of at most 90° with an inner surface of the ceramic tube."<sup>2</sup>

These statements are respectfully traversed. The ceramic tube 5 of Stegmüller and the ceramic tube 25 of Sinnecker are just that, tubes, which are clearly understood by one of ordinary skill in the art to be cylindrical structures wherein the surface thereof is traced by a straight line moving parallel to a fixed straight line and intersecting a fixed planar closed curve, such as a circle. The structure 2 of Siemens AG is also a cylindrical structure, except for a bevel that the inventor intentionally placed on the outer side of the cylindrical structure 2. However, the inner side of that cylindrical structure 2, as shown, has no such bevel and is normal to the end face of that cylindrical structure.

It is submitted that none of the references, whether taken alone or in combination, teaches or suggests a ceramic tube, wherein at the triple junction of metal end cap, ceramic tube and vacuum chamber, a cylindrical end face on an inner side of such ceramic tube forms an angle of substantially 90°, ***but less than 90°***, with an inner surface of such ceramic tube. Each of the references, taken as a whole, teaches or suggests to one of ordinary skill in the art an angle equal to 90° between a cylindrical end face and an inner surface of a cylindrical ceramic tube. Thus, the references clearly do not anticipate Claim 1 under Section 102(b). Furthermore, one of ordinary skill in the art would clearly be motivated to avoid the refined recital of Claim 1 for reasons of increased manufacturing cost as is discussed in the present specification. Hence, it is respectfully submitted that the Examiner reaches the conclusion of obviousness through the use of hindsight, which is clearly improper.<sup>3</sup>

In view of the above, it is submitted that the skilled artisan having knowledge of the prior art will find no motivation whatsoever in any of the references of record to

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<sup>2</sup> As to former Claims 3, 5 and 7, for each of the three references, the Examiner takes the apparently contradictory view (Office Action, pages 4, 5 and 6) that the angle is "at least 90°". It is submitted that the only way to reconcile these views is to make the angle equal to 90°.

<sup>3</sup> To reach a proper determination under 35 U.S.C. 103, the examiner must step backward in time and into the shoes worn by the hypothetical "person of ordinary skill in the art" when the invention was unknown and just before it was made. In view of all factual information, the examiner must then make a determination whether the claimed invention "as a whole" would have been obvious at that time to that person. Knowledge of applicant's disclosure must be put aside in reaching this determination, yet kept in mind in order to determine the "differences," conduct the search and evaluate the "subject matter as a whole" of the invention. The tendency to resort to "hindsight" based upon applicant's disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.

provide the solution according to Claim 1 as now presented. Indeed, the skilled artisan would be motivated to provide any of the solutions offered in the references, which are different from the refined recital of Claim 1. The references do not teach or suggest a ceramic tube wherein the cylindrical end face on an inner side of the ceramic tube forms an angle of substantially 90°, **but less than 90°**, with an inner surface of the ceramic tube. Therefore, Claim 1 patentably distinguishes over the references.

Claim 4 depends from Claim 1 and patentably distinguishes over the references for at least the same reasons.

Reconsideration and early allowance are requested.

Respectfully submitted,



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